

# PATENT ABSTRACTS OF JAPAN

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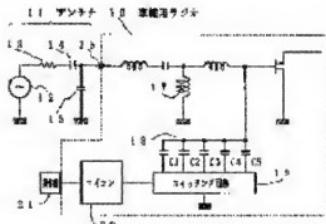
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## (54) ON-VEHICLE RECEIVER

### (57)Abstract:

**PURPOSE:** To attain sure matching between a vehicle antenna and an antenna circuit of an on-vehicle receiver by adjusting an antenna input characteristic by means of an identification code in response to an antenna.

**CONSTITUTION:** A microcomputer 20 of the on-vehicle receiver 10 outputs a matching circuit selection signal in response to the input characteristic of an antenna input circuit designated by the operation of an operation button 21 to a switching circuit 19. Then an antenna 11 and a matching capacitor 18 to appropriately match the antenna input circuit are selected and ground connection is conducted. Thus, even when the stray capacitance of an antenna cable or the like is changed, the matching capacitor 18 is selected so as to set the matching capacitance of the antenna 11 to be a specified value depending on vehicle family by entering an identification code depending on the vehicle family by the operation button 21 to sufficiently enhance the performance of the vehicle receiver 10 at its design time.



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## CLAIMS

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[Claim(s)]

[Claim 1] The receiver for mount characterized by having the code input means for inputting the identification code according to an antenna, the adjustment device which adjusts antenna input characteristics, and the control means which controls said adjustment device according to said code input means.

[Claim 2] It is the receiver for mount according to claim 1 which said adjustment device consists of a switch which connects two or more capacitors and these capacitors to the antenna input circuit of said receiver alternatively, and is characterized by said control means controlling the connection condition of said switch.

[Claim 3] It is the receiver for mount according to claim 1 which it connects with the antenna input circuit of said receiver, and said adjustment device consists of an electrical-potential-difference variable-capacity component from which capacity changes according to applied voltage, and is characterized by said control means controlling the electrical potential difference impressed to said electrical-potential-difference variable-capacity component.

[Claim 4] Said code input means is a receiver for mount according to claim 1 characterized by being \*\*\*\*\* of said receiver.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the receiver for mount, and relates to the receiver which can be adjusted especially suitable for the antenna of a broad type of a car.

[0002]

[Description of the Prior Art] In the radio set side which the configuration and the method change with types of a car, and circuits, such as an antenna amplifying circuit (antenna amplifier), are connected depending on the case, and connects the antenna of the receiver for mount, for example, the radio for mount, to an antenna, the suitable adjustment constant in an antenna input circuit changes according to those conditions.

[0003] Therefore, it is required to set up the circuit element of an antenna input circuit so that adjustment with an antenna may become the optimal, and to fully demonstrate the engine performance at the time of the design of the radio for mount in antenna input circuits, such as radio for mount. However, in which type of a car the radio for mount, especially the radio for mount marketed are attached, and since it was not decided, the aperiodic circuit where adjustment with an antenna does not pose a problem comparatively is used for the antenna input circuit, and the activity of taking adjustment with an antenna anew at the time of installation etc. is not usually done.

[0004]

[Problem(s) to be Solved by the Invention] However, even if it uses an aperiodic circuit, it becomes a difference by adjustment with the antenna by adjustment of the variable capacity for adjustment at the receiving engine performance of the radio for mount, and appears. For example, although the resonance point with the coil of antenna cable capacity and an antenna input circuit has excepted the transmission-line noise etc. besides \*\*\*\*\* in the receiver as shown in drawing 4 (attenuation), it will be in the condition that antenna cable capacity changes, the resonance point changes, approach a received frequency band, or the resonance point goes into a received frequency band, and attenuation of a transmission-line noise etc. runs short, and input active jamming will occur. Moreover, on the radio for mount of an automatic-tuning method, when the resonance point changes to the sensibility switching characteristics at the time of automatic tuning etc., it becomes impossible to maintain the specification at the time of a design, and a bad influence may be caused to automatic-tuning actuation.

[0005] This invention solves such a problem and it aims at the antenna of a car and the antenna circuit of the radio for mount which were equipped with the radio for mount having consistency exactly, and fully demonstrating the engine performance at the time of the design of the radio for mount.

[0006]

[Means for Solving the Problem] It is characterized by equipping this invention with the code input means for inputting the identification code according to an antenna, the adjustment device which adjusts antenna input characteristics, and the control means which controls said adjustment device according to said code input means, in order to solve the above-mentioned technical problem.

[0007] Moreover, it is characterized by for said adjustment device consisting of a switch which connects two or more capacitors and these capacitors to the antenna input circuit of said receiver

alternatively, and said control means controlling the connection condition of said switch. Moreover, it connects with the antenna input circuit of said receiver, said adjustment device consists of an electrical-potential-difference variable-capacity component from which capacity changes according to applied voltage, and said control means is characterized by controlling the electrical potential difference impressed to said electrical-potential-difference variable-capacity component.

[0008] Moreover, said code input means is characterized by being \*\*\*\*\* of said receiver.

[0009]

[Function] According to this invention, if the identification code according to an antenna is inputted with a code input means, an adjustment device will be controlled by the above means and let antenna input characteristics be a suitable thing with them so that a control means may be suitable for this antenna. Moreover, an adjustment device adjusts a switch and connects it to an antenna input circuit so that it may become suitable having consistency with an antenna two or more capacitors.

[0010] Moreover, an adjustment device impresses an electrical potential difference so that adjustment with an antenna may become suitable to the electrical-potential-difference variable-capacity component connected to the antenna input circuit. Moreover, the identification code according to an antenna is inputted by actuation of \*\*\*\*\*.

[0011]

[Example] Hereafter, the example of this invention is explained to a detail using a drawing. Drawing 1 is drawing having shown the panel of the radio for mount in one example of this invention. Although 2 is a switch which usually switches the receiving band of AM/FM with the change-over switch of the receiving band of the radio 1 for mount, if it continues pushing the receiving band change-over switch 2 several seconds (for example, for 2 seconds), in this example, the radio for mount will switch to the adjustment mode in which the input characteristics of an antenna input circuit are adjusted.

[0012] Although reception of the broadcasting station of choice can be performed by 3 being a push button for a channel selection (six carbon buttons to \*\*-\*\*), making it usually correspond to each of this push button 3 for a channel selection, making the frequency of the broadcasting station received beforehand memorize, and pushing the push button 3 for a channel selection corresponding to the frequency of the broadcasting station of hope At this example, the push button 3 for a channel selection serves as a property selecting switch (identification code input) for choosing the input characteristics of an antenna input circuit by switching to adjustment mode with the receiving band change-over switch 2.

[0013] That is, for example, in adjustment mode, if \*\* and \*\* of the push button 3 for a channel selection are pushed, it will be switched so that the input characteristics of an antenna input circuit may become suitable for the antenna for A vehicles, and if \*\* and \*\* of the push button 3 for a channel selection are pushed, it will be switched so that the input characteristics of an antenna input circuit may become suitable for the antenna for B vehicles. Thus, with the combination which pushes \*\*, \*\* of \*\* of the push button 3 for a channel selection - \*\* has composition which can choose the input characteristics of an antenna input circuit suitable according to a car.

[0014] Next, drawing 2 explains the circuitry of this example. Drawing 2 is drawing showing the circuitry of this example. 10 expresses only the antenna input circuit part with the radio for mount. 11 expresses the equal circuit of the antenna attached in the car, and 12 expresses the power which an antenna generates in response to an electric wave with antenna electromotive

force. 13 is the internal resistance of an antenna and 14 and 15 express the stray capacity of an antenna cable.

[0015] 16 connects the radio 10 for mount with an antenna 11 by the antenna jack, and the electromotive force 12 by the electric wave which the antenna received is inputted into the radio 10 for mount. 17 forms the stray capacity 14 and 15 and the resonance circuit of an antenna cable in an antenna 11 with a high frequency coil, and is removing the strong input active jamming signal (removal of the transmission-line noise especially in AM band etc.).

[0016] 18 is chosen and connected in order to adjust said resonance circuit by the capacitor for adjustment (C1-C5). 19 is a switching circuit, and chooses and carries out ground connection of the capacitor 18 (C1-C5) for adjustment with the matching circuit selection signal from a microcomputer 20. in addition, the capacitor 18 for adjustment -- an unit -- or two or more (put together) selections are made, and ground connection is carried out. With a microcomputer (microcomputer), 20 outputs the matching circuit selection signal according to the type of a car (antenna) specified by actuation of an operating button 21 to a switching circuit 19, and chooses and carries out ground connection of the capacitor 18 (C1-C5) for adjustment for an antenna and an antenna input circuit to have consistency appropriately.

[0017] Therefore, in this example, since the capacitor 18 (C1-C5) for adjustment will choose and ground connection will be carried out so that the adjustment capacity of an antenna may become a regular value (for example, 80pF) according to a type of a car (antenna) if the identification code according to a type of a car (antenna) is inputted by the operating button 21 even if the stray capacity of an antenna cable etc. changes, the radio for mount can be used in the always suitable condition.

[0018] Next, drawing 3 explains the 2nd example. In addition, since the circuit of the capacitor 18 neighborhood for adjustment in the example shown in drawing 2 is changed, this example explains only this changed part. Drawing 3 is drawing showing the circuitry in the 2nd example of this invention, and shows the antenna input circuit part of the radio for mount. 22 is digital one and an analog transducer, and changes and outputs the DESHITARU signal from a microcomputer 20 to the direct current voltage of an analog. 23 is the varicap connected to the antenna input circuit, and capacity changes with change of the direct current voltage impressed.

[0019] In addition, the output data to the contents of actuation and the analog-to-digital converter 22 of an operating button 21 correspond to a microcomputer 20, it memorizes, and the data according to the contents of actuation of an operating button 21 are outputted to an analog-to-digital converter 22. Next, if the operating button 21 explaining actuation is operated and the identification code corresponding to a type of a car (antenna) is inputted into a microcomputer 20, a digital signal which serves as the antenna input circuit property of having been suitable for the microcomputer 20 empty-vehicle kind (antenna) will be outputted to an analog-to-digital converter 22.

[0020] And an analog-to-digital converter 22 impresses an electrical potential difference from which the capacity in an antenna input circuit becomes the best for a type of a car (antenna) at varicap 23, and varicap 23 changes to a suitable capacity which an antenna and an antenna input circuit adjust suitably. As mentioned above, the radio for mount can be used in the suitable condition like the 1st example also by this example. Moreover, if many output voltage to the analog-to-digital converter 22 corresponding to a type of a car (antenna) is memorized on the microcomputer 22, even if it does not use many capacitors, it can respond to many types of a car (antenna) by one varicap.

[0021]

[Effect of the Invention] Since an antenna and an antenna input circuit can be appropriately adjusted according to this invention even if a type of a car, i.e., an antenna, changes as explained to the detail above, the receiver for mount can be used in the always optimal condition.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] Drawing having shown the panel of the radio for mount in one example of this invention

[Drawing 2] Drawing showing the circuitry of the 1st example of this invention

[Drawing 3] Drawing showing the circuitry of the 2nd example of this invention

[Drawing 4] Drawing showing a strong input active jamming removal property

[Description of Notations]

- 1 ..... Lashio for mount
- 2 ..... Receiving band change-over switch
- 3 ..... Push button for a channel selection
- 11 ..... Antenna
- 12 ..... Antenna electromotive force
- 13 ..... Internal resistance
- 14 ..... Antenna cable stray capacity
- 15 ..... Antenna cable stray capacity

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